

A Work Project, presented as part of the requirements for the Award of a Master's degree in
Management from the Nova School of Business and Economics.

**BECOMING AN ENTREPRENEURIAL UNIVERSITY: CHARACTERISTICS,
MODELS AND IMPACT ON EXTERNAL ENVIRONMENT**

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Abstract

The literature review describes how two academic revolutions changed the characteristics of universities towards the external environment, leading them to act as enterprises. The purpose is to analyse the models that universities have been developing, the factors that influence their activities and the consequences of universities' entrepreneurial behaviour. To do so, the literature review evaluated academic papers and relevant publications. The analysis shows that entrepreneurial universities developed new missions to allow them to have a stronger impact on the external environment. To conclude, future research could describe a third academic revolution that is leading to the advancement of sustainable universities.

Keywords: entrepreneurial university, entrepreneurship, teaching, education, innovation, technology, social impact, external environment, sustainable universities.

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1. Introduction

A first academic revolution took off in the late 19th century in the U.S., by making the research, together with the traditional teaching activities, part of the academic functions (Jenks & Riesman, 1968). After that, from the beginning of the 21st century, universities have started to experience a second revolution, characterized by the inclusion of economic and social development as part of their missions (Etzkowitz, 1998, 2003, 2004; Etzkowitz & Leydesdorff, 2000). This revolution turned the academic research into a tool to create technological development and commercial application while, previously, it used to be perceived as source of wealth and progress.

In this context, activities such as social planning, innovating policies and networking have increased their importance in universities. The main role of these activities is relating the academic research with the external socioeconomic environment (Krucken & Meier, 2006) and creating relationships that lead to the establishment of start-ups and bigger companies (Etzkowitz, 1998). As a consequence, from one hand, the technological innovation is implementing the research; from the other hand, the boundaries between industries and academia are getting weaker (Etzkowitz, 1998). The result is that the academic entrepreneurship is shifting the strategy from a mere organizational growth system, to a social development-based strategy which aims to create a financial advantage from its activities (Etzkowitz et al., 2000).

Universities' educational system is also facing a transition; indeed, it is moving from a system focused in the development of activities that aim to increase student's personal

knowledge, to activities that allow students having relationships with outer organizations (Etzkowitz & Klofsten, 2005). These changes have caused a shift of the definition of entrepreneurial scientists from teachers who pursue research to guarantee funds from outer agencies (Vollmer, 1962), to teachers who both interact with industries and universities to manage diversified portfolios of industrial relationships (Powell, 1996).

Furthermore, traditional European universities are turning more sophisticated and are becoming debilitating; they are underlining a need for a higher managerial capacity (Clarke, 1998), characterized by a logic that challenges the traditional norms and values usually based on academic professionalism, democratization and regulation (Engwall, 2007; Teelken, 2015). Even public universities are facing increasing pressure to become more entrepreneurial, since they are acting more as a firm competing in the market, trying to differentiate themselves from other universities and companies operating in the same industry (Clark, 1998; Kwiek, 2013; Meier & Schimank, 2010).

It is fair to mention that there is a big but fragmented (Rothaermel, Agung & Jiang, 2007) and potential (Guerrero & Urbano, 2010; Salamzadeh, A., Salamzadeh, Y. & Daraei, 2011) literature in this topic of research, that can usefully be used to enlighten future avenues for the development of entrepreneurial universities.

The purpose of the research is to summarize, restructure and revise previous studies about the development and reorganization of entrepreneurial universities. The motivation of the paper is to clarify the definition of an entrepreneurial university and to analyse the ongoing discussion on this topic in the current literature. Therefore, the research questions

this paper aims to address are: what are entrepreneurial universities and in what way are they innovating the teaching and educational functions? What models characterize them? What are the consequences of entrepreneurial universities' activities?

The method that has been used is the literature review integrated with academic papers and published articles. All of these sources are strongly related with the themes of: entrepreneurial universities, innovation and technologies, education, teaching and impact on external environment. The period of these articles ranges from 1968 to 2020.

The remaining of this literature review is organized in five chapters that will cover: i) entrepreneurial universities and their managerial logic, ii) the entrepreneurial universities models, iii) factors that influence entrepreneurial universities, iv) the consequences of being an entrepreneurial university, v) conclusion and personal contribution and inputs for further research.

2. Entrepreneurial Universities and their managerial logic

In the literature can be noticed various definitions to describe entrepreneurial universities (Table 1). Some of the authors' definition lie on the way entrepreneurial universities act as business creators (Chrisman (1995), Clark (1998), Kirby (2002)); other definitions underline the way entrepreneurial universities engage relationships with external entities (Etzkowitz (1983), Subotzky (1999)). Moreover, Jacob (2003) differentiates entrepreneurial universities from traditional universities for the way they create value

with innovative activities. Finally, Röpke's definition (1998) of entrepreneurial universities lies on the belief that they are characterized by the aggregation of multiple factors.

Table 1: *distinction of entrepreneurial universities main definitions*

<i>Distinction factor</i>	<i>Author</i>	<i>Definition</i>
<i>Entrepreneurial Universities as business creation entities</i>	Chrisman (1995)	"The entrepreneurial university involves the <u>creation of new business ventures</u> by university professors, technicians, or students." (p. 268)
	Clark (1998)	"An Entrepreneurial University, on its own, seeks to innovate in how it goes to business. Entrepreneurial Universities <u>seek to become 'stand-up' universities</u> that are significant actors in their own terms." (p. 7)
	Kirby (2002)	"As at the heart of any entrepreneurial culture, Entrepreneurial Universities <u>have the ability to innovate, recognize and create opportunities</u> , work in teams, take risks and respond to challenges." (p. 2)
<i>Universities as partners with external enterprises</i>	Etzkowitz (1983)	"Universities that are considering new sources of funds like patents, research under contracts and <u>entry into a partnership with a private enterprise</u> ." (p. 198)
	Subotzky (1999)	"The entrepreneurial university is characterized by <u>closer university-business partnerships</u> , by faculty responsibility for accessing external sources of funding, and by a managerial ethos in governance, leadership and planning." (p. 402)
<i>Universities as value creators to the external environment</i>	Jacob (2003)	"An Entrepreneurial University is based on both <u>commercialization</u> (customs made education courses, consultancy services and extension activities) <u>and commoditization</u> (patents, licensing or student owned start-ups)." (p. 1555)
<i>Entrepreneurial Universities as aggregation of multiple factors</i>	Röpke (1998)	"An entrepreneurial university can <u>mean three things: the university itself, as an organization, becomes entrepreneurial; the members of the university—faculty, students, employees - are turning themselves somehow into entrepreneurs; and the interaction of the university with the environment</u> , the 'structural coupling' between university and region, follows entrepreneurial pattern." (p. 2)

Source: *Own Elaboration Based*

Entrepreneurial universities are endorsed in order to include multi- and inter-disciplinarity (Gibbons, Limoges & Nowotny, 1994) instead of only defending the traditional disciplinary borders as source of autonomy and identity (Henkel, 2005). In this context, the economic development becomes the new main function universities consider next to the conventional research and teaching (Clark, 1998); this is the reason why teachers are officially and formally called entrepreneurial professors (Lam, 2008).

These universities include entrepreneurial values in the academic culture to reach economic profits deriving from students' capabilities and projects, team work activities and networks with professors or external entities (Formica, 2002). Meanwhile, entrepreneurial universities strongly influence the regional development and general economic growth in terms of high-tech, research, capabilities and technological transfers (Zhou & Peng, 2008). Their forward-looking orientation and interest towards innovation, together with a managerial logic and ethos in values such as governance and leadership, is what allows them to better access external sources and financial channels (Etzkowitz, 1983; Clark, 1998; Subotzky, 1999; Kirby, 2002; Yokoyama, 2006).

To summarise, these organizations aim to be support incubators (Etzkowitz, 2003) for the establishment and launch of new businesses (Chrisman, Hynes & Fraser, 1995; Röpke, 1998) and to benefit from the commercialization of their research's results (Dill, 1995; Jacob, Lundqvist & Hellsmark, 2003; Williams, 2003). Therefore, an entrepreneurial university is an entity that tries to save the competitive environment by covering various strategies oriented to be the best in all its activities. In order to reach this success,

universities need to obtain financing, produce great talents, hire good professors, offer satisfying projects' results and create impactful links between education and research (Kirby, 2005). Consequently, an entrepreneurial university aims to develop new organizations, strategies and competitive objectives (Antoncic & Hisrich, 2001). To make this possible, these universities often conclude agreements and establish relationships with public and private organizations to guarantee interaction and co-operation (Inzelt, 2004). The final goal, indeed, is to adopt strategies and collaborations with government and other relevant companies in favourable industries to share and exploit knowledge, technology and innovation (Leydesdorff & Meyer, 2003).

3. The Entrepreneurial University models

The literature offers multiple models linked with entrepreneurial universities. Academic relationship with the industry is a clear indicator that states the shift of the university into a more complex organization that imitates industrial counterparts (Ziman, 1991). This relationship can be translated into an effort made by universities to offer academic results and support to external people who aim to establish their own companies. In this way, entrepreneurial universities are characterized by an internal model that places them as service providers to encourage the foundation of new firms. Thus, these firms' development is based on a right balance between economic and academic values (Etzkowitz, 1998).

In order to make this possible, universities have started to change their own strategic goals (Patterson, 2001), to introduce new academic and technological systems (Herbert &

Tienari, 2013) and to develop marketing, reputational and branding plans to enhance value from their stakeholders' perceptions and attract new talents (Aspara et al., 2014; Chapleo, 2010; Lowrie, 2007; Waeraas & Solbakk, 2009). Moreover, Ropke (1998) stated that the model of any entrepreneurial university is characterized by: a well-developed entrepreneurial management style, qualified entrepreneurial members and continuous entrepreneurial interaction with the environment. Other essential elements in entrepreneurial universities' models are: well-defined objectives, organization, mission, networks, strategic relationships and values (Sporn, 1999a, 2001).

Besides Ropke's view, the literature offers various elements to define entrepreneurial models for universities; indeed, from one hand they are identified as incorporation, communication channels, support, recognition, rewards, endorsement and promotion-based organizations (Kirby, 2005); from the other hand Rothaermel (2007) and O'Shea (2005, 2007 and 2008) concluded that there are other formal and informal elements, which are: technologic development, human capital, physical, commercial and financial resources, status and prestige, localization and relationships with external stakeholders. All these components show how well-developed entrepreneurial models are essential in order to give flexibility and dynamicity to universities. It is fair to state that entrepreneurial universities' models are similar to an Input-Output dynamic model, characterized by: formal, informal and internal inputs; formal, informal and internal processes (e.g., logistical processes, financial processes, researches and networking); formal, informal and internal outputs (e.g. innovating results, technological outputs or formative discoveries). These characteristics are fundamental to enhance capabilities and competences to fulfil entrepreneurial missions (Salamzadeh, A., Salamzadeh, Y. &

Daraei, 2011; Sooreh et al., 2011). An interesting article that describes the model of entrepreneurial universities is mentioned in the work “*Creating Entrepreneurial Universities. Organizational Pathways of Transformation*” by Clarke in 1998. This model defines the five requirements entrepreneurial universities need for an economic viability:

- i. A “*rigorous internal governance*”; entrepreneurial universities need consistent governance able to include new economic values in the traditional academic ones.
- ii. Enhancing a new “*periphery*”; entrepreneurial universities have updated infrastructures to better and smoothly trade with external stakeholders.
- iii. A “*diversified funding base*”; entrepreneurial universities widen the financial base in order to have access to greater financial resources.
- iv. The “*stimulated academic heartland*”; the academic heartland, in Clarke’s opinion, is where the traditional values are mostly rooted. Therefore, it has to be flexible and able to be aligned with the new system.
- v. An “*integrated entrepreneurial culture*”; as previously mentioned, it is fundamental to develop a new culture that is able to embrace changes.

The “*innovative model*” has also been analysed to develop another entrepreneurial model known as the “*Triple Helix Model*”. This model, is explained in the work “*The future of the university and the university of the future: evolution of ivory tower to entrepreneurial paradigm*” written by Etzkowitz, Webster, Gebhardt and Cantisano Terra and published in 2000. It defines entrepreneurial universities’ models as a dynamic course of four interconnected processes that encourage the development of an entrepreneurial culture.

The first process is an internal transformation; during the first academic revolution, teaching included methods to enhance knowledges; lately the teaching activity got relevant to test the academic knowledge in real world situations and to behave as a link between universities and external stakeholders.

The second process is the establishment of a new equilibrium to create new institutional spheres in which interactions are easily reachable.

The third process is the increasing of capabilities for intelligence, monitoring and negotiation with government and other stakeholders.

Finally, entrepreneurial universities need to develop capabilities to contribute for the creation of new organizations.

This brief description of the “*Triple Helix Model*” describes how entrepreneurial universities can become institutions to both create innovating systems by providing human capital and to encourage the creation of new companies (Etzkowitz et al., 2000).

Universities can apply different models and processes to become more entrepreneurial (Krejsler, 2006; Czarniawska & Genell, 2002). However, pressures from the external environment are still shaping similar models’ characteristics especially in the Western side of the globe (Wedlin, 2008). This is why, developing efficient entrepreneurial models is important to allow universities to better compete against similar organizations and reach sufficient financing sources in order to offer the most qualitative services to the market (Engwall, 2007; Hemsley-Brown & Goonawardana, 2007).

4. Factors that influence entrepreneurial universities

The literature offers the opportunity to understand the main external, internal, informal and formal factors that affect the development of entrepreneurial universities (Guerrero & Urbano, 2010). These universities, indeed, not only create talents, but they also interact with external industries or other entities (Gibbons et al., 1994). The ecosystem of an entrepreneurial university represents the actors that create inter-relationships between entrepreneurs or companies and universities, in order to shape the entrepreneurial environment (Brown & Mawson, 2019). Furthermore, academic organizations are becoming more oriented to the market (Czarniawska & Genell, 2002) since they are recognized by policy-makers as costumer-oriented service providers (Engwall, 2007; Ng and Forbes, 2009). However, in the recent past, relating with external entities is getting complicated since companies in the industry are seeing universities as challengers in the role of creating new firms generating increasing competition (Etzkowitz, 1998).

Moreover, entrepreneurial universities need to keep in consideration the local, state and federal governments' objectives when aiming to develop new operations. From a local perspective, government verifies the contribution that entrepreneurial universities give to enrich the lifestyle and wealth of the citizens in a specific area. From a statal perspective, government is interested on the way universities are led and managed to guarantee specific living conditions; this challenge influences entrepreneurial universities' activities since this creates competition between entrepreneurial universities which aim to reach better rankings at a state level. To conclude, the federal government mostly takes into account entrepreneurial universities as an indicator of knowledge and capabilities amongst the global economy (Ferreira et al., 2018). Thus, entrepreneurial universities are

forced to consider the contribution their students are able to give on a global economic level.

As mentioned before, the literature underlines some informal and formal factors that both affect the development of entrepreneurial universities and characterize them.

4.1 Informal factors

An informal factor is the open-mindedness of the students towards the entrepreneurial world. This open-mindedness can easily support the generation of entrepreneurial universities since the members who are part of it are more exposed to the development of projects that have different goals compared to the merely academic ones (Krueger & Brazeal, 1994). Based on the challenging methods entrepreneurial universities offer, students feel more comfortable in studying in such universities than in the traditional ones (Guerrero, Rialp, & Urbano, 2008; Krueger, Reilly, & Carsrud, 2000; Veciana, Aponte, & Urbano, 2005; Liñán & Chen, 2009; Liñán, Urbano, & Guerrero, 2011).

Another factor that may influence the development of new entrepreneurial activities are the meetings that take place in these universities. Compared to pure academic meetings that usually aim to deal with internal and organizational themes, entrepreneurial universities organize forums and conferences more oriented to have an impact on external environment. The literature shows that the goal of meetings in such universities is to define the necessary activities to carry out in order to take advantage of new opportunities (Bygrave & Hofer, 1991). These conferences are characterized by two main components: the event, characterized by the introduction of new ideas; and an agent, which is

represented by the group of people responsible to carry out the whole conference and put in place the activities (Morris & Jones, 1999).

To conclude, there are other informal factors that are typical in companies and influence universities' process to act like enterprises. These factors have both monetary and non-monetary characteristics. The most common are monetary rewards, bonus, benefits and upgrades and personal recognition, all depending on personal performances. As mentioned, these elements are strongly considered in universities when their goal is to be more entrepreneurial (Bernasconi, 2005; Kirby, 2006; Miclea, 2004). The presence of these factors in universities' structure, indeed, encourages the introduction of employees' evaluation and feedback activities on regular bases (Colby, 2002).

4.2 Formal factors

An important formal factor to consider is the inclusion of vigorous full-time leadership positions for the most talented professors and students (Dill, 1995; Sotirakou, 2004; Sporn, 2001). This aspect is important to have a flexible organization and internal governance (Clark, 1998; Lazzeretti & Tavoletti, 2005) and to enhance shared ideas when interacting with shareholders (Sporn, 2001; Dearlove, 2002). Furthermore, these leading members are skilled enough to catch the main occasions resulting from collaborations between academic organizations and external entities (Darling, Gabrielsson, & Serista, 2007). Including such leaderships positions, indeed, allows to improve the quality of the activities and make the decision process smoother.

Another relevant formal factor is the national culture that characterizes the country where a specific university is based in. This factor, indeed, is an influence on how societies, but also universities, develop entrepreneurial activities both towards the internal managerial decisions and the external environment. National culture also influences universities and societies' decisions towards risk taking, growth opportunities, ease of innovation and business opportunities (Ortega-Anderez & Lai, 2017).

5. The consequences of being an entrepreneurial university

In the last decades the role of various universities has been changing; compared to traditional universities, entrepreneurial universities are focusing on providing new products through new activities and innovative tools (Klofsten & Jones-Evans, 2000). These new abilities are allowing these universities to influence the external environment, especially on a regional level (Acs, Fitzroy & Smith, 1995). However, the consequences of the activities of entrepreneurial universities in the market has been a matter of discussion in the literature.

One of the main problems of acting as an entrepreneurial university is linked with the potential conflicts between internal (academic) and external (economic) values (Faria, 2002). Once defined the economic values aimed by entrepreneurial universities (e.g., maximization of profits), it is hard to also focus on the traditional values that would already appear obsolete compared to the new economic ones. Overcoming the barrier that separates academic and economic values, thus, may generate catastrophic results since the system may lead to an irreversible situation (Etzkowitz, 2000). Etzkowitz (2000),

concludes that the best way to both create boundaries between academic and business activities and to avoid potential values' conflicts is rather differentiating economic and academic activities or enriching business activities with further institutional objectives.

Another problem that arises when universities become entrepreneurial is linked with the reduction of university's autonomy due to the increased management power (Parker & Jary, 1995). Acting as an enterprise, makes people acting more individualistic, while, in academic communities, collaboration and co-participation are the priority. The increasing of individualism, thus, may cause a loss of focus in the academic role universities previously had, which was to create knowledge, capabilities and talents (Ylijoki, 2005).

Next to the above-mentioned problems that becoming entrepreneurial may lead to, there are also important positive consequences that universities consider.

A relevant positive consequence can be noticed in terms of encouraging industrial innovating processes, improving universities funding, and boosting the development of new technologies (Van Looy, Callaert & Debackere, 2006). Furthermore, universities that act in entrepreneurial ways have the benefit of being supporters of stakeholders' business activities through projects findings and results. Entrepreneurial universities, indeed, play the important role of global innovators and have a strong impact on knowledge systems (Brown & Mawson, 2019).

Another positive consequence of being entrepreneurial is that graduate entrepreneurs develop appropriate competencies and knowledge to contribute positively to the economic system. Industries not only want to hire great talents and students, but also innovators, scientists and people with an entrepreneurial mindset. Creating talents and having impact on a socio-cultural level are the key elements that make entrepreneurial universities able to have a positive impact on the external environment (Gibb, 2012). Indeed, data taken from the National Council for Graduate Entrepreneurship show that 80% of the most high-growth and high-tech firms have been founded or managed by students who graduated in universities characterized by a strong entrepreneurial attitude (Hannon, 2013). In other words, entrepreneurial universities are able to exchange knowledge and capabilities produced within the universities into capital necessary to satisfy the interest of external stakeholders (Fraser, 2012).

Acting as an entrepreneurial university is also bringing the attention of many universities to follow up companies' sustainable development. Indeed, lots of entrepreneurial universities have been signing documents to prove their commitment to help guaranteeing sustainability (Leal & Wright, 2002). These universities, are trying to decrease as much as possible the impact on environment's health caused by the use of specific resources (Velazquez et al., 2006). As it happens in the entrepreneurial world, even universities that aim to be like companies are setting themselves new responsibilities regarding the grant of health and well-being of people and the ecosystems when facing social and ecological challenges (Cole, 2003). As companies focus on resource waste attention, waste reduction and promotion of social justice and equities, also entrepreneurial universities are trying

to make these concepts as integrant part of their mission and goals (Alshuwaikhat & Abubakar, 2008).

To conclude, it is fair to underline that by acting as enterprises, universities not only are imitating, recreating and experiencing companies' organization, goals and attitudes, but are also shifting their attention on other social and sustainable challenges. This attitude is driving entrepreneurial universities into a third revolution, based on research of sustainability and environmental care activities.

6. Conclusion

The literature review analysed recent discussions around various authors concerning to the development and implementation of entrepreneurial universities on a global level.

In the second chapter the literature review describes what in the literature is meant by “Entrepreneurial University”. Even though the literature presents different definitions and conceptualization of this expression (as shown on Table 1), it is still possible to notice some shared points to differentiate these universities from the traditional ones. Entrepreneurial universities not only aim to create talents, but they also encourage technologic development, innovation and social impact. These elements are the main causes of the shift to a new managerial logic. This logic, indeed, is not only based on beliefs and values typically academic, but also on other characteristics properly

entrepreneurial such as: acting as support providers, creating opportunities and experiencing new challenges (Friedland & Alford, 1991; Thornton & Ocasio, 2008).

Afterwards, the literature review presents different models that can differentiate and describe entrepreneurial universities. The main focus is in the description of the “*Innovative Model*” by Clarke (1998), Ropke’s model (1998), the “*Triple Helix Model*” by Etzkowitz (2000) and the related insights from other authors. The main characteristic that correlates these models is the belief in the existence of Input-Output dynamic processes (Salamzadeh, A., Salamzadeh, Y., & Daraei, 2011; Sooreh et al., 2011) and the continuous relation these universities have with the external entities. Dynamic activities, flexible structures and forward-looking orientation are the main elements that distinguish entrepreneurial universities’ models and the traditional ones.

In the fourth chapter the literature review defines the main formal and informal factors that may influence entrepreneurial universities’ activities. The main factors are classified in monetary and non-monetary, and are: personal rewards, benefits, bonus, personal recognition and upgrades. Other factors that influence the development of entrepreneurial activities are the relationships with external entities and governmental pressures. Finally, also national culture has an influence on activities entrepreneurial universities aim to develop. This influence includes the risks of businesses each country presents, the business opportunities offered in the market, the ease of innovation and open-mindedness towards innovating systems, teaching methods and organization.

Finally, in chapter five, the literature review deals with the possible consequences of acting as entrepreneurial universities. There are negative effects since it may generate traditional values non-observance, conflict of interests and loss of university's roles autonomy (Krimsky, 1991; Brooks, 1993). Furthermore, including new economic values among the academic ones, may lead universities to only focus on the mission of creating profits, typical of companies' core, instead of also creating talents and knowledge. However, the literature also shows various positive consequences, such as: giving relevant economic contribution; offering impactful teaching methods that aim to develop students' mindset to face new challenges; allowing students to take part to projects that have impacts on external environment.

Another important influence that companies are having on universities is linked with the sustainability research objectives that are being incorporated in companies' targets. Entrepreneurial universities, as such, are also introducing study programmes, webinars, and academic activities focused on educating students to become socially capable to help reaching a more sustainable future in the community. These concerns are becoming the key elements and prerogatives for a potential third revolution in the academic environment that can drive into the introduction of a new concept of entrepreneurial universities: the sustainable universities.

6.1 Personal contribution and inputs for further research

The literature review deals with the conceptualization of entrepreneurial universities, aiming to define the characteristics, models and factors that have mostly been discussed

by various authors. The main contributions of the literature review are: i) describing how the dynamic models that characterize entrepreneurial universities are allowing these universities to positively react to crisis or external changes other than impacting the external environment, ii) showing how innovative entrepreneurial activities finalized to guarantee a more sustainable future are representing a marketing tool in order to reach the best students around the globe, iii) underlining how the interactions with external entities that entrepreneurial universities engage also represent networking opportunities for students.

The literature review reveals that there has been a strong concentration on how entrepreneurial universities can create opportunities and benefit the external environment by offering support for companies or by being start-up incubators. However, given that entrepreneurial universities can have positive impact on external entities, it is important to define if these universities also offer a structure, organization and internal policies able to positively react and face external crisis or changes.

Traditional universities are mostly focused on obsolete studying methods, as obsolete is their internal organization; the central issue for traditional universities is to allow students to have the opportunity to increase their knowledge in specific studying fields. However, unexpected external events may create difficulties in such universities. The Covid19 crisis which is spreading around the globe since the end of 2019, for instance, is impacting both social, economic, health sectors and the educational and working systems. Both traditional and entrepreneurial universities, indeed, have been encouraged to confer online classes in order to allow students to attend lectures remotely. During this difficult

period, companies have been able to readapt their systems, organizations and working methods with relatively few difficulties. Entrepreneurial universities, as explained in Etzowitz's (2000) above mentioned "*Triple Helix Model*", are characterized by a new internal and transformed structure compared to the traditional universities. This new dynamic internal organization allows entrepreneurial universities promoting e-meetings, e-lectures and regular projects presentations through online tools. All of this is possible due to the flexible organization and dynamic decision processes. Meanwhile, traditional universities are attempting to follow up companies or entrepreneurial examples, but the deficiency of smooth processes and internal flexibility are making the whole process slow. In some Italian universities considered traditional, the beginning of lectures for the academic year 2020/2021 has been postponed by a few months due to the absence of solutions or tools needed to guarantee lectures remotely. Such universities, as characterized by obsolete and just in-place studying methods, have also caused difficulties to both professors and students.

Being entrepreneurial, does not only provide for a flexible and dynamic internal structure. It also provides for a forward-looking orientation, that allows to reorganize the internal structures in case of external changes. This way, universities can create opportunities even from negative events and crisis as companies do (e.g., Google have decided to close some offices for an indefinite period given the efficiency of the work from home of some employees' specific category. This way, Google can benefit from the crisis by guaranteeing flexibility for employees, decreasing costs and real estate needs, but still having positive working outcomes (New York Times, 2020)). It is possible to believe, indeed, that the future of entrepreneurial universities will be characterized by both remote

and in place lectures and activities, given the positive outcomes this solution is currently performing.

The second contribution of the literature review is related with the description of how entering into a third revolution focused on the research of sustainability can represent a considerable opportunity for entrepreneurial universities to both attract students and positively impact the external environment. Introducing sustainability as core of activities and lectures, indeed, can represent a new marketing, reputational or branding plan to enhance value from entrepreneurial universities' stakeholders' perceptions and attract new talents (Aspara et al., 2014; Chapleo, 2010; Lowrie, 2007). This revolution relies in the attempt of universities to arrange sustainable programmes. In the literature, it is already possible to notice three ways to measure universities' sustainability levels: accounts, narrative assessment and indicator-based assessment (Dalal-Clayton and Bass (2002). Aiming to be sustainable means developing internal models and tools to reach out new missions and objectives. In this context, students' involvement and project-based activities are also very important to create awareness and education. The main shift in this topic is the introduction of lectures that aim to educate young generation of students in a new way, allowing them to become active managers in charge of changing the society.

Recently, sustainability and environmental care are concepts that are becoming part of people's life. Universities' goal of obtaining the best students, also advances by taking advantage of opportunities. Entrepreneurial universities, by offering classes that cover sustainability as a central theme, aim to attract all those students that are looking for such topics and studying paths. Non-entrepreneurial universities, as described in the literature

review, are mostly focused on traditional studying paths and have more difficulties to reorganize and innovate their courses.

As a result, entrepreneurial universities which are willing to include the sustainability as part of their mission, are the ones with bigger opportunities to include more open-minded students, able to be part of innovative and fast paced companies that work to guarantee a more sustainable future to the world. From another perspective, being able to cover sustainable topics can indirectly and directly help entrepreneurial universities to have important social impact on a theme that, in this decade, is becoming delicate. Entrepreneurial universities' direct contribute is linked with the introduction of new activities addressed to create awareness over the importance of sustainability. The indirect contribution is linked with entrepreneurial universities' social support of educating and developing graduate students able to join sustainable companies.

In this chapter, the focus has mainly been in the organizational and structural characteristics that make entrepreneurial universities future-oriented. However, it is proper to consider other consequences of entrepreneurial universities' activities. Another contribution of the literature review, indeed, is related with the outcomes of the relationships that students establish once they are part of entrepreneurial universities.

In the last decade, the working world has been creating high pressures on young students. Job opportunities are not as many as in previous years since the competition among graduate students has been increasing. As mentioned in the literature review by Etzkowitz (1983), Subotzky (1999) and Jacob (2003), entrepreneurial universities aim to create talents, able to provide resources to external companies. However, it is important to also

consider other relationships students can establish when they are part of entrepreneurial universities. More precisely, it is important to underline an important factor that differentiates entrepreneurial universities from the traditional ones. This factor is embodied in the whole academic community that students have the opportunity to interact with. Entrepreneurial universities offer a big set of networks; interaction with colleagues, professors and companies' employees during presentations, are all possibilities that these kinds of universities offer. Moreover, the access to online tools (e.g., Job Teaser), organization of job fairs where all students are invited to participate and weekly companies' presentations, make students' networking process even easier. The absence of job opportunities and the increasing level of competition among companies to hire the best graduate students, indeed, testify how crucial engaging relevant networks can be.

Moreover, entrepreneurial universities are characterized by a more international community (e.g., Nova SBE in academic year 2020-2021 is characterized by 46% Portuguese people and 54% non-Portuguese students from 46 different countries (Nova SBE, 2020)). Such level of internationality is not present in traditional universities, in which foreign students only represent a minority. Since entrepreneurial universities' community include people from different countries, they allow students to also enlarge their networks internationally.

Especially in the current historical moment, which is strongly encouraging people to study and work abroad, offering the opportunity to establish wide set of relationships and networks is an important factor and tool that allows entrepreneurial universities to attract the most talented students.

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